

These charts are intended as selection guides only. For complete and precise specifications, consult the data sheet for each model.

Semiconductor Charged-Particle Detectors	
Application	Recommended Preamplifier
Energy or Timing Spectroscopy	Models 142A, 142B, or 142C are best. Final choice depends on capacitance of detector. Also see Model 142AH for special applications.
General	Model 142IH, a general-purpose, economical choice.

Proportional Counters and Ionization Chambers	
Application	Recommended Preamplifier
Energy Spectroscopy or Counting	Model 142PC is optimum. Model 142IH is the most cost-efficient choice for general-purpose applications.

Photomultiplier Tubes, Electron Multipliers, Scintillation Detectors, Microchannel Plate PMTs, Microchannel Plates, Channeltrons, and Photodiodes	
Application	Recommended Preamplifier
Time Spectroscopy	<p>Model FTA820A (0 to -5 V output, rise time <1 ns), 8 channels (octal) in a single wide NIM.</p> <p>Model VT120 (0 to -5 V output, rise time <1 ns) is the best for fast PMTs and Electron Multipliers. It can also be used with Photodiodes, Microchannel Plate PMTs, Microchannel Plates, and Channeltrons.</p> <p>Model 9301 has ± 0.7 V output, rise time <1.5 ns.</p> <p>Model 9305 has variable gain, ± 5 V output drive, dc-coupled (for high count rates), rise time <3 ns.</p> <p>Model 9306 (0 to -2 V output, rise time = 350 ps) is best for Microchannel Plates and Channeltrons. It can also be used with fast PMTs and Photodiodes.</p> <p>Model 9309-4 has 0 to ± 2 V output, rise time <1.5 ns, dc-coupled (for high count rates), quad in a single wide NIM.</p> <p>Model 9310-16 has ± 2 V output, rise time <1.5 ns, dc-coupled (for high count rates). 16 in a single wide NIM.</p> <p>Model 9326 (+0.25 to -1 V output, rise time <1 ns) is ideal for use with the <i>FASTFLIGHT</i> Digital Signal Averager, due to the 10 kHz low-frequency roll-off.</p>
Energy Spectroscopy	<p>Models 142A and 142AH are the ideal choices for Channeltrons, Micro-channel Plate PMTs, Microchannel Plates, and Photodiodes.</p> <p>Model 113 is a low-cost solution for PMTs and Scintillation detectors.</p> <p>Model 142IH is a general-purpose, economical choice.</p>

Charged-Particle Spectroscopy with Semiconductor Detectors											
Model	Detector Type	Features	Sensitivity		Equivalent Input Noise (FWHM)* Energy		Rise Time (ns at pF)	Range (MeV)*	E2CRP (MeV ² /s)*	Detector Bias Resistor (MΩ)	Maximum Detector Bias Voltage (Volts)
			(mV/MeV)	(μV/e-h pair)	keV at pF	Electrons at pF					
142A	Si	Excellent timing and low noise for 0 to 100 pF detectors; high sensitivity and small size.	20	0.07	<1.6 at 0 <3.4 at 100	442 at 0 939 at 100	<5 at 0 <12 at 100	0–200	2 x 10 ⁷	100 or 10	±1000
142B	Si	Excellent timing and low noise for detector capacitances >100 pF; small size.	10	0.04	<3.2 at 100 <19 at 1000	884 at 100 5249 at 1000	<5 at 100 <25 at 1000	0–100	5 x 10 ⁷	100 or 10	±1000
142C	Si	Excellent timing and low noise for detector capacitances >400 pF; small size.	10	0.04	<7.2 at 400 <27 at 2000	1989 at 400 7459 at 2000	<11 at 400 <20 at 1000	0–400	5 x 10 ⁷	100 or 10	±1000
142AH	Si	Excellent timing and low noise for deep detectors; high bias voltage capability and high sensitivity.	20	0.07	<1.75 at 0 <3.6 at 100	483 at 0 994 at 100	<5 at 0 <12 at 100	0–100	2 x 10 ⁷	100	±5000
142IH	Si	General-purpose, low-cost preamplifier.	15	0.05	1.9 at 0 4.6 at 100 35 at 1000	524 at 0 1270 at 100 9660 at 1000	<20 at 0 <50 at 100	0–100	8 x 10 ⁷	100 or 10	±3000

*Energies are referenced to 3.62 eV/e-h pair in silicon detectors and 2.96 eV/e-h pair in germanium detectors.

Spectroscopy with Proportional Counters									
Model	Type	Features	Sensitivity	Equivalent Input Noise		Rise Time (ns at pF)	Output Linear Range (V)	Detector Bias Resistor (MΩ)	Maximum Detector Bias Voltage (Volts)
			(μV/Electron-ion pair)	FWHM* (Electrons at pF)	rms* (Electrons at pF)				
142IH	PC	General-purpose, low-cost preamp suitable for use with charged-particle detectors, scintillation detectors, or proportional counters.	0.05	524 at 0 1270 at 100	223 at 0 540 at 100	<20 at 0 <50 at 100	±7	100 or 10	±3000
142PC	PC	Low-noise, high-gain, charge-sensitive unit designed for use with proportional counters.	0.6	<800 at 0 <1140 at 100	<340 at 0 <485 at 100	25 at 0 150 at 100	±7	30	±3000

*Note: FWHM = 2.35 x rms.

Energy Spectroscopy with Scintillation Detectors, PMTs, Electron Multipliers, Microchannel Plates, Microchannel Plate PMTs, Channeltrons, and Photodiodes					
Model	Features	Sensitivity (μV/Electron)	Noise (rms)	Rise Time (ns)	Output Linear Range (V)
113	Economical parasitic-capacitance preamplifier with selectable input capacitance to vary sensitivity.	3.6×10^{-3} to 1.5×10^{-4}	Output noise: <100 μV	<60	±7
142A	Fast rise time, charge-sensitive preamplifier for energy and time spectroscopy with microchannel plates, channeltrons, and photodiodes.	7×10^{-2}	Input noise: 188 electrons at 0 pF 400 electrons at 100 pF	<5 at 0 pF <12 at 100 pF	±7
142AH	Use instead of Model 142A when a 1000-V to 3000-V bias voltage must be supplied through the preamplifier.	7×10^{-2}	Input noise: 206 electrons at 0 pF 423 electrons at 100 pF	<5 at 0 pF <12 at 100 pF	±7
142IH	General-purpose, charge-sensitive preamplifier; insensitive to variations in detector capacitance.	5×10^{-2}	Input noise: 223 electrons at 0 pF 540 electrons at 100 pF	<20 at 0 pF <50 at 100 pF	±7
276	Parasitic-capacitance preamplifier incorporated in a 14-pin PMT base for 10-stage PMTs.	1.6×10^{-3}	Output noise: <50 μV	<100	0 to +10
296	Parasitic-capacitance preamplifier incorporated with a detector bias supply in a 14-pin PMT base for 10-stage PMTs.	2.7×10^{-4} or 1.6×10^{-3}	Output noise; <300 μV	<100	0 to +6.5

Fast Timing and Fast Counting with Scintillation Detectors, Photomultiplier Tubes, Electron Multipliers, Microchannel Plates, Microchannel Plate PMTs, Channeltrons, and Photodiodes							
Model	Features	Gain (V/V)	Input Impedance (Ω)	Equivalent Input Noise (μV rms)	Output Rise Time (ns)	Coupling	Output Linear Range (V)
VT120 A/B/C	Very fast rise time for use with PMTs, microchannel plates, microchannel plate PMTs, channeltrons, electron multipliers, and photodiodes. Note: FTA820A is 8 channels of VT120A in a single wide NIM.	A: 200 B: -200 C: 20	50	<20	<1	ac	0 to -5
9301	Very fast rise time for use with PMTs, microchannel plates, microchannel plate PMTs, channeltrons, electron multipliers, and photodiodes.	10	50	<25	<1.5	ac	>±0.7
9305	Fast rise time for use with PMTs and electron multipliers. DC-coupled for baseline stability at high counting rates.	Variable 5 to 10	50	<30	<3	dc	±5
9306	Ultra-fast rise time for use with microchannel plate PMTs, microchannel plates, channeltrons, and photodiodes.	100	50	<100	0.5	ac	0 to -2
9309-4	Fast rise time for use with PMTs and electron multipliers. DC-coupled for baseline stability at high counting rates. Quad in a single wide NIM.	Variable 0 to 10	50	<50	<1.5	dc	0 to ±2 V 2 outputs
9310-16	Fast rise time for use with PMTs and electron multipliers. DC-coupled for baseline stability at high counting rates. Octal in a single wide NIM.	10	50	<50	<1.5	dc	±2 V 2 outputs
9326	Very fast rise time, and 10-kHz low-frequency roll-off for use with FastFlight in TOF-MS. Use with microchannel plates, PMTs, electron multipliers, channeltrons, and photodiodes.	Selectable 5, 10 or 20	50	<100	<1	ac	0 to -1

Specifications subject to change
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